Brett Evan Barkley

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Education

The University of Texas at Austin, PhD   **2022 - Present**
Computer Science   **GPA:** 4.00
Focus in Deep Reinforcement Learning and Robotics

University of Maryland, M.S   **2015 - 2017**
Aerospace Engineering   **GPA:** 3.97
Focus in Control Theory and Dynamical Systems

University of Maryland, B.S   **2010 - 2015**
Aerospace Engineering (Honors Program)   **GPA:** 4.00

Selected Coursework

AI: Causality and Reinforcement Learning (in progress), Deep Learning, Natural Language Processing
Dynamics and Control Theory: Linear Systems and Control, Nonlinear System Control, Stochastic System Control

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Technical Skills

Languages: C++, Python, Cython, Matlab, Bash, CUDA
Libraries/Software: Git, Ray, RLlib, Pytorch, CasADi, LaTeX

Experience

Autonomy Aerospace Engineer, Johns Hopkins University Applied Physics Lab (JHU/APL)   **2017 - 2022**

- JHU/APL's Air Combat Evolution (ACE) deep reinforcement learning (DRL) lead for sub and full-scale aircraft
- DRL developer and research sub-team lead (sim-to-real, domain adaptation, training architecture)
- Guidance, control, and aerospace simulation subject matter expert (SME) for JHU/APL ADT and ACE teams
- Simulation design co-lead and integration lead for ACE 6 DOF aircraft and missile simulation

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Projects

RL Path Planning for High G Aircraft, JHU/APL, Laurel, MD   **2021 - 2022**

- Built RLlib based training architecture incorporating curriculum learning and sign-of-life unit tests

DARPA ACE Sim-to-Real, JHU/APL, Laurel, MD   **2021 - 2022**

- Sub-task team lead on numerous sim-to-real tasks for AI in DARPA Air Combat Evolution (ACE) program
- Team lead for parameter randomization impact study and simulation integration

DARPA ACE Agent Training and Simulator Development, JHU/APL, Laurel, MD   **2019 - 2022**

- Helped develop deep reinforcement learning training architecture and aerospace specific observation space
- Led JHU/APL team in developing 6-DOF simulator for sub and full-scale aircraft in C++ and Cython

Vision Based Control of SuperTuxKart ice-hockey Player, CS394D Deep Learning , Austin, TX   **2020**

- Built a vision only 2v2 SuperTuxKart ice hockey agent using CNN's and strategic logic
- Agent finished in top 20% of class

Target Detection, Tracking, and Reacquisition with UAVs University of Maryland   **2015 - 2017**

- Created a kinematic simulation for ground vehicles operating on graph representations of real road networks
- Designed novel motion planning algorithms for fixed wing UAVs
- Built track-before-detect, data association, and track-after-detect algorithms for ground target tracking